

## ABSTRACT

A system, amplifier and method are provided for amplifying an optical signal in an optical communications system where spans between amplifiers may vary. The system includes a Raman amplifier variable gain portion and an EDFA gain portion. The amount of Raman amplifier gain is chosen to trade off accumulation of noise with accumulation of multi-path interference. This variable Raman gain is used to equalize the loss of each span so that the amount of optical power supplied at the input of the EDFA gain portion is substantially constant throughout the system.

FOUO " 921550